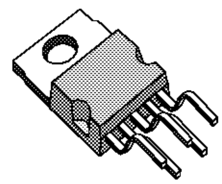
SGS-THOMSON MICROELECTRONICS

# L387A

## VERY LOW DROP 5V REGULATOR WITH RESET

- PRECISE OUTPUT VOLTAGE (5 V ± 4 %)
- VERY LOW DROPOUT VOLTAGE
- OUTPUT CURRENT IN EXCESS OF 500mA
- POWER-ON, POWER-OFF INFORMATION (RESET FUNCTION)
- HIGH NOISE IMMUNITY ON RESET DELAY CAPACITOR



**Pentawatt®**

**ORDERING NUMBER :** L387A

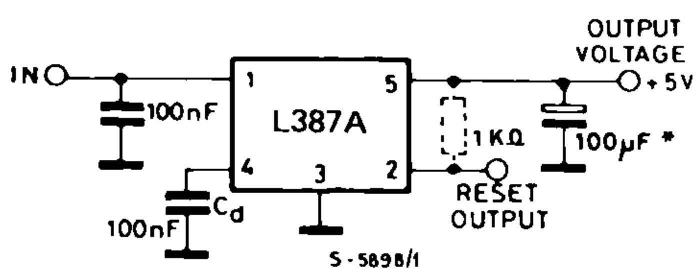
### DESCRIPTION

The L387A is a very low drop voltage regulator in a Pentawatt® package specially designed to provide stabilized 5V supplies in consumer and industrial applications. Thanks to its very low input/output voltage drop this device is very useful in battery powered equipment, reducing consumption and prolonging battery life. A reset output makes the L387A particularly suitable for microprocessor systems. This output provides a reset signal when power is applied (after an external programmable delay) and goes low when power is removed, inhibiting the microprocessor. An hysteresis on reset delay capacitor raises the immunity to the ground noise.

### ABSOLUTE MAXIMUM RATINGS

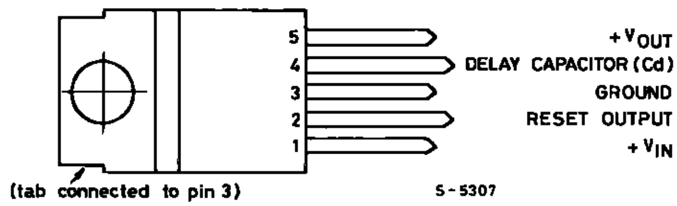
| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_i$ | D.C. Input Voltage | 35 | V |
| $T_j$, $T_{stg}$ | Junction and Storage Temperature Range | –55 to 150 | °C |

### APPLICATION CIRCUIT

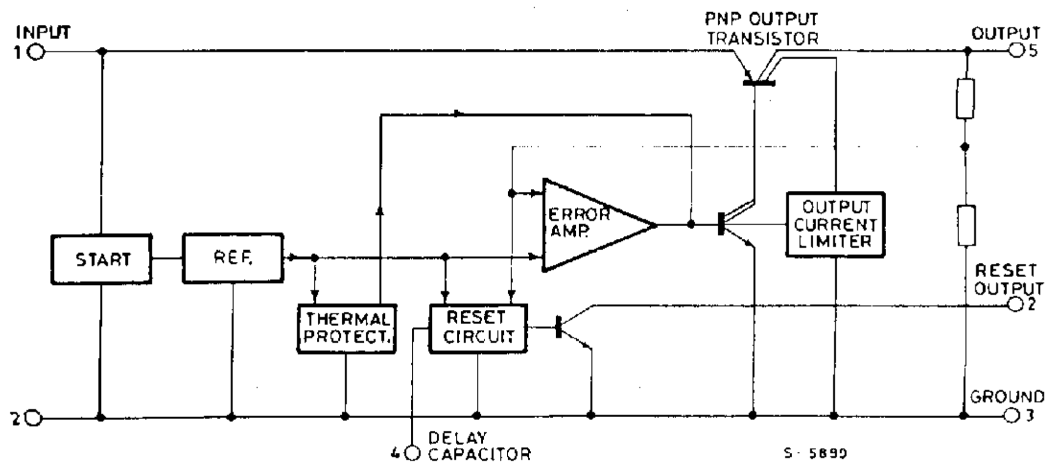



* Min 33 μF and max. ESR ≤ 3 Ω over temperature range.

## PIN CONNECTION (Top views)




## BLOCK DIAGRAM




## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 4 | °C/W |

**ELECTRICAL CHARACTERISTICS** (refer to the test circuit, $V_i$ = 14.4 V, $T_j$ = 25 °C, $C_o$ = 100 µF; unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_o$ | Output Voltage | $I_o$ = 5 mA to 500 mA $T_j$ = 25 °C<br>– 40 ≤ $T_j$ ≤ 125 °C | 4.80<br>4.75 | 5.00<br>5.00 | 5.20<br>5.25 | V<br>V |
| $V_I$ | Operating Input Voltage | (*), Over Full T Range (– 40 to 125 °C) (see note **) | | | 26 | V |
| $\Delta V_o$ | Line Regulation | $V_i$ = 6 V to 26 V $I_o$ = 5 mA | | 5 | 50 | mV |
| $\Delta V_o$ | Load Regulation | $I_o$ = 5 mA to 500 mA | | 15 | 60 | mV |
| $V_I - V_o$ | Dropout Voltage | $V_O = V_{O\ NOM}$ – 100 mV<br>$I_o$ = 350 mA<br>$I_o$ = 500 mA | | <br>0.40<br>0.60 | <br>0.65<br>0.8 | <br>V<br>V |
| $I_q$ | Quiescent Current | $I_o$ = 0 mA<br>$I_o$ = 150 mA<br>$I_o$ = 350 mA<br>$I_o$ = 500 mA | | 5<br>20<br>60<br>100 | 15<br>35<br>100<br>160 | mA<br>mA<br>mA<br>mA |
| | | $V_i$ = 6.2 V $I_o$ = 500 mA | | 160 | 180 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Temperature Output Voltage Drift | | | – 0.5 | | mV/°C |
| SVR | Supply Voltage Rejection | $I_o$ = 350 mA f = 120 Hz<br>$C_o$ = 100 µF $V_i$ = 12 V ± 5 $V_{pp}$ | | | 60 | |
| $I_{SC}$ | Output Short Circuit Current | | | 1.2 | 1.6 | A |
| $V_R$ | Reset Output Voltage | $I_R$ = 3 mA 1 < $V_o$ < 4.70 V<br>$I_R$ = 16 mA 1.5 < $V_o$ < 4.75 V<br>Over Full T (– 40 °C ≤ $T_j$ ≤ 125 °C) | | | 0.5<br>0.8 | V<br>V |
| $I_R$ | Reset Output Leakage Current | $V_o$ in Regulation $V_R$ = 5V<br>Over Full T Range | | | 50 | µA |
| $t_d$ | Delay Time for Reset Output | Cd = 100 nF<br>Over Full T Range | | 25 | | ms |
| $V_{RT\ (off)}$ | | $V_o$ @ Reset out H to L Transition, Over Full T Range | 4.75 | $V_o$<br>– 0.15 | | V |
| $I_{C4}$ | Charging Current (current generator) | $V_4$ = 3 V | 10 | 20 | 30 | µA |
| $V_{RT\ (on)}$ | Power on $V_o$Threshold | $V_o$ @ Reset out L to H Transition , Over Full T Range | | $V_{RT\ (off)}$<br>+ 0.05 V | $V_o$<br>– 0.04 V | V |
| $V_4$ | Comparator Threshold (pin 4) | $V_4$ @ Reset out H to L Transition | 3.2 | | 3.9 | V |
| | | $V_4$ @ Reset out L to H Transition | 3.7 | | 4.3 | V |
| $V_H$ | Hysteresis Voltage | Over Full T Range | | 450 | | mV |

(*) For a DC voltage 26 < Vi < 37 V the device is not operating.
(**) Design limits are guaranteed (but not 100 % production tested) over the indicated temperature and supply voltage ranges. These limits are not used to calculate outgoing quality levels.

**Figure 1** : Dropout Voltage vs. Output Current.

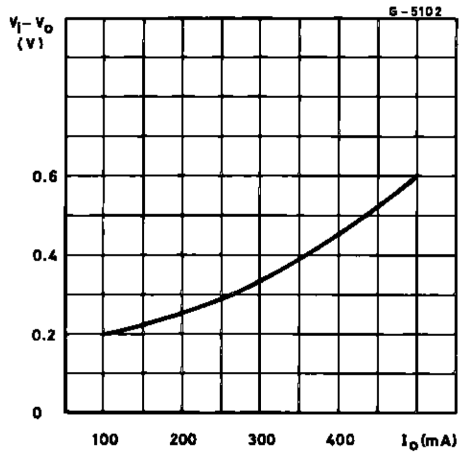



**Figure 2** : Quiescent Current vs. Output Current.

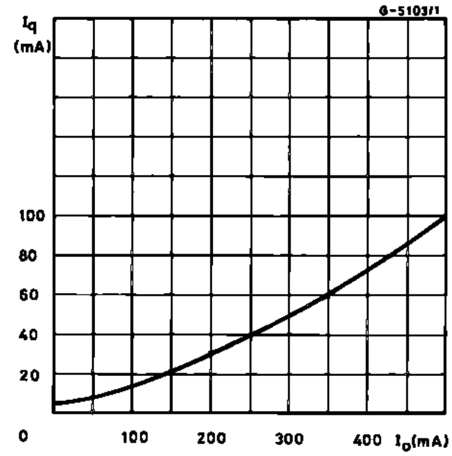
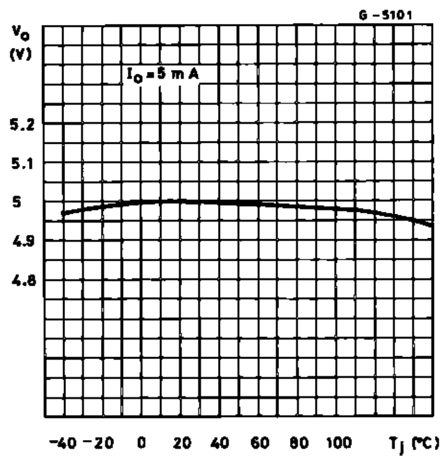



**Figure 3** : Output Voltage vs. Temperature.



PENTAWATT PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 4.8 | | | 0.189 |
| C | | | 1.37 | | | 0.054 |
| D | 2.4 | | 2.8 | 0.094 | | 0.110 |
| D1 | 1.2 | | 1.35 | 0.047 | | 0.053 |
| E | 0.35 | | 0.55 | 0.014 | | 0.022 |
| F | 0.8 | | 1.05 | 0.031 | | 0.041 |
| F1 | 1 | | 1.4 | 0.039 | | 0.055 |
| G | | 3.4 | | 0.126 | 0.134 | 0.142 |
| G1 | | 6.8 | | 0.260 | 0.268 | 0.276 |
| H2 | | | 10.4 | | | 0.409 |
| H3 | 10.05 | | 10.4 | 0.396 | | 0.409 |
| L | | 17.85 | | | 0.703 | |
| L1 | | 15.75 | | | 0.620 | |
| L2 | | 21.4 | | | 0.843 | |
| L3 | | 22.5 | | | 0.886 | |
| L5 | 2.6 | | 3 | 0.102 | | 0.118 |
| L6 | 15.1 | | 15.8 | 0.594 | | 0.622 |
| L7 | 6 | | 6.6 | 0.236 | | 0.260 |
| M | | 4.5 | | | 0.177 | |
| M1 | | 4 | | | 0.157 | |
| Dia | 3.65 | | 3.85 | 0.144 | | 0.152 |

